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Monsters and the theoretical role of context*

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– forthcoming in *Philosophy and Phenomenological Research* –

In his seminal work on context-sensitivity, Kaplan (1989) famously claimed that *monsters*—operators that (in Kaplan’s framework) shift the context, and so “control the character of indexicals within [their] scope”—do not exist in English and “could not be added to it” (1989: 510). Kaplan pointed out that indexicals (like the English words “I” and “you”) seem to be interpreted in the same way no matter how they are embedded, so that (for example) if David utters a sentence like (1), “I” picks out David (rather than Otto):

- (1) Otto said that I am a fool

Kaplan claims that the lesson of this example generalises: “I” always picks out the speaker; one just cannot find, or even stipulatively introduce, operators that shift the interpretation of “I”.

Kaplan’s case against monsters looks empirical, and recent writers have pointed out a range of data that seem to point the other way: propositional attitude constructions in a variety of languages (Schlenker 2003; Anand and Nevins 2004), certain modal claims in English (Santorio 2012), and even variable binding understood in a standard Tarskian way (Rabern 2013) are naturally interpreted as monstrous. But there is also a principled argument, traceable to an interpretation of Lewis (1980) and defended explicitly by Stalnaker (2014), that monsters are impossible. Stalnaker points out that contexts, construed as ordered n -tuples consisting of a speaker, a time, and perhaps other parameters, can be used by theorists to play a variety of theoretical roles. One of these roles is to represent situations in which an utterance might take place. For example, when we evaluate a sentence in a

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context, we want our semantic theory to deliver (at least roughly) the truth value that an utterance of that sentence would have if it were made in the situation represented by the context. But the idea of a linguistic expression *shifting* context so construed makes little sense. An operator can't change the physical setting in which an utterance takes place.

In short, Stalnaker's lesson is:

- (S) In evaluating claims about monsters, one must pay attention not only to the formal devices of one's semantic theory, but also to the theoretical role that these formal devices play.¹

This makes good sense of Kaplan's claim that context-shifting operators are "monsters begat by elegance". Kaplan's elegant formalism makes it easy to define context-shifting operators. But on certain ways of understanding what we are using context to represent, it is not clear what theoretical role context-shifting operators could possibly play.²

Stalnaker combines this principled stance with a recipe for handling apparently monstrous data: since all parties agree that truth values of sentences depend on further parameters—the *index*—and everyone agrees that the index can be shifted by operators, Stalnaker suggests that we should construe the apparently "shiftable indexicals" as sensitive not to the context, but to the index.³ We agree that there is no technical obstacle to such a proposal. But we claim that the proposal ignores Stalnaker's own lesson (S). The interesting issue is not whether we can design a formal system that shifts one parameter rather than another; of course we can. The interesting issue is whether an adequate semantic theory can avoid operators that play certain theoretical roles.

¹A lesson that Kaplan himself was well aware of: his discussion of monsters is immediately preceded by the remark that "mere double indexing, without a clear conceptual understanding of what each index stands for, is still not enough to avoid all pitfalls" (1989: 510).

²Kaplan (1989: 512): "We could... instead of having a logic of contexts and circumstances... simply [have] a two-dimensional logic of indexed sets. This is algebraically very neat... But it also permits a simple and elegant introduction of many operators which are monsters. In abstracting from the distinct conceptual roles played by contexts of use and circumstances of evaluation the special logic of indexicals has been obscured."

³Strictly speaking, not everyone agrees that truth values of sentences depend on the index, and that sentential operators shift the index; a schmentencite such as Schaffer (2012) holds that *sentences* never embed under index-shifting operators. We set this sort of view aside.

We propose to explain and defend this claim by contrasting two kinds of semantic theory—Kaplan’s and Lewis’s. Both systems disallow operators that shift the “context”. But these bans not only have different motivations, they have very different effects. In Kaplan’s system, the same entity (content) plays two roles—the roles sometimes called *assertoric content* and *compositional semantic value*. This means that Kaplan’s ban on context-shifting operators amounts to a ban on operators that shift factors that determine assertoric content. Because Lewis separates the two roles, his system does not ban shifting factors that determine assertoric content. And we claim that this is what is really at issue in debates over monsters; so construed, the debate about monsters is not just a dry, technical matter, but reflects deep disagreements about the fundamental structure of a semantic theory. We will defend the following three claims:

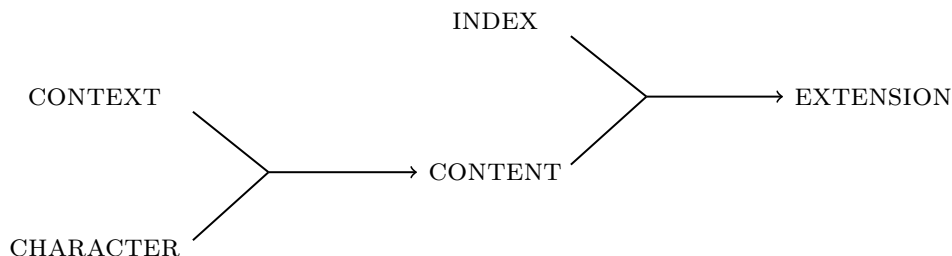
1. The interesting notion of a monster is *not* an operator that shifts some formal parameter, but rather an operator that shifts parameters that play a certain theoretical role.
2. One cannot determine whether a given semantic theory allows monsters simply by looking at the formalism. One must understand the theoretical role of the formalism; in particular, one must understand what the various parts of the formal theory are being used to represent.
3. The proposal—to shift only the “index” parameter, and to forbid shifting the “context” parameter—is therefore perfectly compatible with the existence of monsters (in the interesting sense).

1 Kaplan and Lewis on Context-Sensitivity

The early semantic theories for context-sensitive language developed by Montague (1968), Scott (1970), and Lewis (1970) generalised the techniques of intensional semantics by expanding the “points of reference” to include various contextual parameters. Contemporary semantic theories are based on the mature ancestors of the early frameworks, namely those developed in Kaplan (1989) and Lewis (1980). The systems of Kaplan and Lewis share many important structural and mathematical similarities, but these formal analogies obscure some crucial differences.

Kaplan and Lewis both insisted that the early theories must be amended with a certain sophistication. It is not enough to just relativise truth to a list of parameters; there must also be a division of theoretical labor between the components of a “point of reference”. There’s a context, and there’s an index, and the two do different kinds of work. Points of reference are treated as context-index pairs.

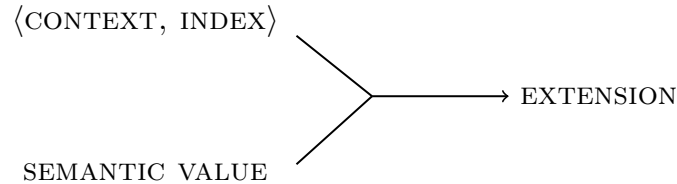
Kaplan viewed the notion of a point of reference employed by early theorists as a misguided attempt to “assimilate the role of context to that of circumstance” (1989: 509). He insisted, instead, on a two-step semantic procedure.⁴



Contexts play a content-generating role—resolving context-dependence in order to determine what’s said—and indices play a content-evaluating role—they’re the things of which what’s said is either true or false. According to Kaplan, the two-step procedure is crucial, since a central task of a semantic theory is to tell us what sentences *say* in various contexts—what propositions or pieces of information do they express in a given context.

⁴As Stalnaker (2017) emphasises, there are two independent, often conflated, reasons for Kaplan’s insistence on this two-step procedure: (i) a linguistic motivation stemming from the compositional interaction of intensional operators and indexicals (for example, the fact that indexical expressions such as “now” do not seem to shift in the scope of (what Kaplan saw as) intensional operators such as “In the future”, as demonstrated by sentences like “In the future, everyone now living will be dead”); and (ii) a pragmatic motivation stemming from the idea that a semantic theory should give an account of assertoric content and its broader role in communication. But the empirical issue surrounding the interpretation of indexicals under intensional operators doesn’t actually motivate the distinction between a context and an index that are supposed to do different kinds of work; nor does it motivate the concomitant character/content distinction. Accommodating the empirical facts simply requires *double indexing* (or, more generally, multiple indexing) (Kamp 1971)—that is to say, points of reference must include multiple parameters of the same type—and that is compatible with the idea that the theoretical roles of these parameters should not be sharply distinguished in the way Kaplan supposed.

Lewis agrees that “[c]ontexts and indices will not do each other’s work” (Lewis 1980: 89), but he disagrees that the two-step procedure is theoretically motivated. Lewis insists that there is another perfectly good option, which is just to evaluate at both a context and index in one step.



Given this one-step procedure the semantic value of a sentence does not vary across contexts—it’s constant—but it’s a function from context-index pairs to truth-values—it’s complicated. Whereas on the two-step procedure semantic values are variable—different values in different contexts—but simple—a function from indices to truth-values. Lewis insists that this distinction between variable but simple values and constant but complicated values is a “distinction without difference” (1980: 91). He emphasises the fact that mathematically there is not a genuine difference between these two options. A theory of the first sort can be easily converted into one of the second and visa versa simply by currying or uncurrying the functions. Lewis asks,

Given the ease of conversion, how could anything of importance possibly turn on the choice between our two options? (1980: 92)

Kaplan and Lewis diverge on this issue because they diverge on the role of assertoric content in the semantic theory—and they diverge on how assertoric content is determined from semantic value in a context. For Kaplan, *content is king*. Content has a privileged role in the semantic theory proper: it is both “what is said” and a level of semantic value over which the composition rules can be defined—contents are what operators operate on. For Lewis, assertoric content, insofar as it has a theoretical role to play, is strictly *post-semantic*. He agrees that “we can assign propositional content to sentences in context” and that “propositions have an independent interest as suitable objects for attitudes such as belief, and [illocutionary acts]” (Lewis 1980: 93), but he doesn’t build into the semantics proper an identification between

assertoric content and sets of indices (i.e. semantic values in a context).⁵ That is, context and index are playing different roles in the two frameworks: for Lewis, in contrast to Kaplan, the “context” is not a sequence of content-generating parameters, and sets of indices are not propositions.

2 Content and Compositional Value

The various sets and functions associated with the standard semantic frameworks, e.g. sets of context-index pairs, sets of indices (relative to a context), functions from contexts to sets of indices, might be (or represent) *meanings* in some sense. But questions concerning which sets or functions correspond to the *real* meaning, in isolation from the theoretical aims of the theory, are misplaced. The important questions concern what explanatory roles the relevant notions of meaning are supposed to play within the theory—what are we trying to explain with these notions of “meaning”—and what entities can play those roles.

One role for the “meaning” of an expression is what we can call the *content role*. The content of an utterance is what has traditionally been called the proposition expressed by the utterance, and it is taken to play a key role in communication. On a standard view, content plays the role of being what successful communication coordinates on: the speaker believes a proposition p , the speaker expresses this belief by uttering a sentence which means p , the hearer understands the sentence and comes to also believe p . Content is thus the object of assertion and the object of attitudes such as belief and knowledge. Yalcin (2014) emphasises that the notion of content in this sense is more generally tied to the representational properties of mental states and “belief-desire psychology”, so in a broader sense the content role concerns certain explanatory roles involving intentionality and rational behaviour. Assertion and communication fall within this broader category.⁶

⁵In this connection Lewis (1980: 92–96) also discusses the appeal to “propositional middlemen” in Stalnaker (1970). Lewis’ main complaint is that by omitting a discussion of the compositional semantics Stalnaker gives a misleading impression of simplicity. That is, one might be misled into thinking that the propositions Stalnaker is talking about can be identified with the semantic values of sentences in context. Lewis is concerned to argue that this identification cannot be maintained.

⁶Yalcin (2014: 19–20) puts it as follows: “...the notion of content has its home in a theory which attempts to explain the representational properties of mental states, the production of behavior at a certain high level of abstraction, and the character and ex-

Kaplan's two-step framework is designed so that once context-dependence is resolved the output is the type of entity that plays the content role. The first hint of this is that Kaplan calls the relevant kind of meaning "what is said". Kaplan states: "I began my investigations by asking *what is said* when a speaker points at someone and says, 'He is suspicious'" (Kaplan 1989: 489).⁷ These intuitive judgments about what is said by an utterance are central to Kaplan's theory. The discussion is full of appeals to common-sense judgments concerning "aboutness" or what was said such as the following:

...if I say, today, 'I was insulted yesterday' and you utter the same words tomorrow, what is said is different. (1989: 500)

Furthermore, Kaplan repeatedly relates his notion of content to the traditional notions such as Fregean sense (1989: 511) and propositional component (1989: 486).

- "The idea of Content—the what-is-said on a particular occasion—is central to my account. It is this notion that I saw, and continue to see, as the primary idea behind Frege's *Sinn*." (1989: 568)
- "The content of a sentence in a given context is what has traditionally been called a proposition." (1989: 500)

Kaplan even states the straightforward identity: Contents = Objects of Thought (1989: 530).

A second role for the "meaning" of an expression is what we can call the *compositional role*. Speakers of a language are able to produce sentences, which they have never before produced, the utterances of which are understandable by hearers who have never before encountered the sentence. For example, over the many years that humans have been speaking a language we can be fairly confident that no one has ever uttered the following sentence (nor even a sentence synonymous with it):

- (2) A surrealist painter and a young French mathematician landed on the icy surface of the smallest moon of Saturn.

planatory power of folk psychological explanations of rational action."

⁷Kaplan is alluding to the discussion in Kaplan (1978).

Yet, we all immediately understand it, and know what would have to be the case for it to be true. The hypothesis that natural languages adhere to the compositionally principle is standardly thought to be the best explanation for their productivity.

PRINCIPLE OF COMPOSITIONALITY: The meaning of an expression is determined by the meanings of its parts and the way they are syntactically combined.

If the language is compositional, then we can explain how a competent speaker of a language can compute the meanings of novel sentences from the meanings of their parts plus their structure.

But here we have been using “meaning” in a loose sense. What are these “meanings” — let’s call them *semantic values* — involved in the composition principle? First, what is the ultimate output of the compositional process? Assuming sentences are the largest expressions, the question becomes what is the semantic value of a sentence. The truth-conditional tradition assumes that one constraint on the semantic value of a sentence is that it encodes its truth-conditions. As a competent speaker of English you know what would have to be the case for (2) to be true. This division amongst various situations into the ones in which (2) is true and the ones in which it isn’t are its truth-conditions—this might be represented as a set of worlds or contexts, etc. So, the compositional process is constrained in so far as its output must encode truth-conditions.

But what about the semantic values of parts of sentences? They have to do the compositional work. Each atomic expression type of the language gets a semantic value; we specify the composition rules such that the rules together with the semantic values determine for each sentence of the language its semantic value. (This semantic value, in turn, determines the truth value that the sentence would have if uttered in a given world or context.)⁸

⁸Lewis nicely sums up the job description for compositional semantic values as follows: “... a compositional grammar must associate with each expression an entity that I shall call its *semantic value*.... These play a twofold role. First, the semantic values of some expressions, the sentences, must enter somehow into determining whether truth-in-English would be achieved if the expression were uttered in a given context. Second, the semantic value of any expression is to be determined by the semantic values of the (immediate) constituents from which it is built, together with the way it is built from them.” (Lewis 1980: 83)

Lewis' framework is designed so that both the functions from context-index pairs and the functions from indices (relative to a context) can play the compositional role. Since they both can play the role equally well, Lewis thinks that there is no real question as to which is *the* semantic value, nor therefore whether one should prefer the one-step or two-step semantics. Kaplan, however, insists that the two-step semantics is preferable, since for him semantic values in context—sets of indices—also play the content role. Thus, for Kaplan this intermediate level of meaning is privileged in so far as it can simultaneously play multiple theoretical roles.

For Kaplan, in addition to being “what is said”, the content of a sentence (in context) also plays the compositional role of being the object of natural language operators; contents are constrained depending on the operators of the language, to be the type of semantic entities that enter into compositional relations with those operators.⁹ It is due to Kaplan's commitment to the compositionality of content that he is led to endorse temporalism about propositions—the view that propositions can vary in truth-value across times.

If we built the time of evaluation into the contents. . . , it would make no sense to have temporal operators. To put the point another way, if what is said is thought of as incorporating reference to a specific time. . . it is otiose to ask whether what is said would have been true at another time. . . (1989: 503)

Contrary to Kaplan, Lewis doubts that one type of semantic entity can play both the compositional role and the content role.¹⁰ In particular, he

⁹Kaplan says, “The Content of the whole is a function of the Content of the parts” (Kaplan 1989: 507). Of course, if the content of the whole is a function of the content of the parts, then the character of the whole is thereby a function of the character of the parts. So if content can play the compositional role, then, trivially, character can as well. But not vice versa. The key point just is that Kaplan insists, while Lewis denies, that the things that play the content role can also play the compositional role—the compositionality of character is beside the point. King and Stanley endorse the same view: “Our understanding of a sentence in a context is due to a compositional procedure that calculates the content of the whole sentence from the . . . contents of its parts. [...] [S]peakers evaluate in a context the characters of syntactically simple expressions in a sentence, and compositionally combine the resulting . . . contents in grasping the proposition expressed by the sentence.” (2005: 122-127)

¹⁰In this sense Lewis endorses what Dummett called the “ingredient sense”/“assertoric content” distinction (see Dummett 1973: 447). See also Evans (1979: 177), Davies and Humberstone (1980: 17-26), Stanley (1997), as well as more recent discussion in Ninan

worries that the parameters that will be required in the indices to provide an adequate compositional semantics might result in sets of indices that are unfit to play the content role. Yalcin summarises Lewis’ worry as follows:

It is possible that, owing to the operators the language in question contains, the semantic value of a sentence relative to context must be some complicated intension, variable with respect to an array of parameters—say, parameters for world, time, location, standard of taste, orientation, standard of precision, state of information, etc. The details here will be a contingent matter concerning the particular architecture of the language in question. It has to do with what expressions (if any) are best semantically modeled as intensional operators. (Yalcin 2014: 23)

We’ve already seen an example of Lewis’ point in Kaplan’s discussion—Kaplan was led to the conclusion that content is variable with respect to a time parameter owing to temporal operators.^{11,12} Kaplan’s treatment of quantifiers provides an even nicer example of Lewis’ point here. In Kaplan’s semantics, sentences are evaluated for truth at a context, index, and

(2010), Rabern (2012), Yalcin (2014), Stalnaker (2017), Recanati (2017), and Rabern (2017).

¹¹Kaplan also considers location neutral contents due to locational operators (p. 504, “Two miles north it is the case that”), and even considers treating “contents in such a way that we can ask whether they are true for various agents” (Kaplan 1989: 511n35). And says that “[t]his can be done by representing the agent by a *neutral*—a term which plays the syntactical role of ‘I’ but gets an interpretation only with respect to a circumstance” (*ibid.*). The proposal is to add an expression ‘*a*’ that gets its interpretation from the (expanded) circumstance, $\llbracket \mathbf{a} \rrbracket^{c,t,w,a} = a$. An agent shifting operator O^R , where R specifies an “accessibility” relation (e.g. $R = \lambda xy.y$ is an uncle of x), can then be defined as follows: $\llbracket O^R(\phi) \rrbracket^{c,w,t,a} = 1$ iff there exists b such that aRb and $\llbracket \phi \rrbracket^{c,w,t,b}$.

¹²Kaplan does notice that there is a tension between the functional notion of content in terms of compositionality and the traditional notion in terms of assertoric content: “This functional notion of the content of a sentence in a context may not, because of the neutrality of content with respect to time and place, say, exactly correspond to the classical conception of a proposition. But the classical conception can be introduced by adding the demonstratives ‘now’ and ‘here’ to the sentence and taking the content of the result. I will continue to refer to the content of a sentence as a proposition, ignoring the classical use” (Kaplan 1989: 504). Although he does not seem to appreciate the implications of the gap between assertoric content and compositional value, here he comes very close to making the relevant distinction, where the assertoric content of a sentence is the same as what its compositional value would be if “now” and “here” (and various other) operators were added to it.

an assignment function; quantifiers are operators that shift the assignment function. Given Kaplan’s view that characters are functions from contexts to contents, and contents are functions from indices to truth values, Kaplan faces a choice: he can regard the assignment function as part of the *context* (i.e., as an input to *character*), or he can regard the assignment function as part of the *index* (i.e., as an input to *content*).

Suppose he opts for the latter option. Then contents will be functions from worlds, times, and assignment functions, to truth values. Contents, so conceived, seem well-suited to play the compositional role (at least for the kind of examples Kaplan is considering). But it is far from obvious that they are well-suited to play the content role. After all, contents represent what is said, the objects of attitudes such as belief, and so forth. What sense does it make to say that what is said, or what is believed, is true or false depending on an assignment function? What could a theorist be representing by modeling what is said in this way?

Perhaps there are good answers to these questions.¹³ But they at least motivate examining the alternative: assignment functions are parameters of context. This is essentially the option Kaplan takes, since he regards the assignment as a content-generating parameter, and for him the context is a list of content-generating parameters. In *Afterthoughts* he suggests the following:

...context is a package of whatever parameters are needed to determine the referent, and thus the content, of the directly referential expressions of the language... Taking context in this more abstract, formal way, as providing the parameters needed to generate content,

¹³Del Prete and Zucchi (2017) explicitly advocate the route of construing the assignment as part of the circumstance, in order to avoid the result that quantifiers are monsters. They also note that in so doing they are departing from standard assumptions concerning “propositions”. Later when providing their semantics for belief attributions, although the semantic value of the complement clause is a set of world-assignment pairs, it is only the singular proposition expressed in the context that is relevant to the belief attribution. This, at least, suggests that the genuine object of belief remains the singular proposition not the semantic value (in context). They even say that “expressions like ‘the object of *x*’s belief’ or ‘the content of *x*’s belief’ in a context *c* need not pick out the semantic value of a that-clause in *c*” (p. 39). Thus, it isn’t clear how seriously they are taking the claim that *propositions* (the objects of belief and assertion) are true or false depending on an assignment function. We discuss the related view of Cumming (2008) in §4.2, he insists that the objects of belief are “open propositions”, which are sets of world-assignment pairs. Likewise, Ninan (2012) argues that the objects of belief are multi-centered propositions.

it is natural to treat the assignment of values to free occurrences of variables as simply one more aspect of context. (Kaplan 1989: 591)

Taking this suggestion on board, we can let a context c determine a sequence of context parameters $\langle a_c, t_c, l_c, w_c, g_c \rangle$, which includes the speaker of c , the time of c , the location of c , the world of c , and the assignment of c , respectively. Given such contexts Kaplan’s definition of the content of a sentence ϕ in the context c , which he symbolises $\{\phi\}_c$, is as follows:¹⁴

Kaplan content. $\{\phi\}_c = \{\langle w, t \rangle \mid \llbracket \phi \rrbracket^{c, w, t} = 1\}$

The problem is that this looks inconsistent with Kaplan’s ban on monsters, since on this way of looking at things, quantifiers are context-shifting operators (Rabern 2013). We return to this issue below; first, we examine Kaplan’s ban on monsters and contrast its effects with Lewis’s framework, which also has no place for context-shifting operators.

3 Formal Monsters and Content Monsters

Kaplan introduces the notion of a monster in the following passage:

My liberality with respect to operators on content, i.e., intensional operators (any feature of the circumstances of evaluation [i.e., the index] that can be well defined and isolated) does not extend to operators which attempt to operate on character. Are there such operators as ‘In some contexts it is true that’, which when prefixed to a sentence yields a truth if and only if in some context the contained *sentence* (not the content expressed by it) expresses a content that is true in the circumstances of that context? Let us try it:

(3) In some contexts it is true that I am not tired now.

¹⁴Of course, in LD Kaplan doesn’t actually package up the assignment g as a parameter of the context, even though it is a content-generating parameter. So his official definition of the content of ϕ in the context c under the assignment g , which he symbolises $\{\phi\}_{c, g}$, is as follows (1989: 546): $\{\phi\}_{c, g} = \{\langle w, t \rangle \mid \llbracket \phi \rrbracket^{c, g, w, t} = 1\}$. We could make all our points within Kaplan’s official LD formalism, but we will present things in this alternative way to highlight certain contrasts with Lewis’ framework.

For [(3)] to be true in the present context it suffices that some agent of some context not be tired at the time of that context. [(3)], so interpreted, has nothing to do with me or with the present moment. [...] Operators like ‘In some contexts it is true that’, which attempt to meddle with character, I call *monsters*. I claim that none can be expressed in English (without sneaking in a quotation device). (Kaplan 1989: 510-1)

What exactly is the problem with monsters, on Kaplan’s view? His objection is that monsters are inconsistent with the idea that indexicals are “directly referential” (his “Principle 2”), which he glosses as “When what was said in using a pure indexical in a context c is to be evaluated with respect to an arbitrary circumstance, the relevant object is always the referent of the indexical with respect to the context c ” (1989: 500). In other words, Kaplan is insisting that if an indexical is used in c , it must be the content with respect to c that is contributed to what is said.

Kaplan initially casts monsters as operators that operate on the character instead of the content of their embedded sentence: “Operators... which attempt to meddle with character” (1989: 511). Such an operator manipulates the context at which the characters of expressions in its scope are evaluated. Just as operators on content are index shifters, operators on character are context shifters. So in Kaplan’s system, an operator is a monster just in case it is (what we will call) a *formal monster*:

Formal Monster. A *formal monster* is an operator that manipulates the “context” parameter c .

Although the notions coincide in Kaplan’s framework, the notion of a formal monster is in an important way more general than the notion of an operator on character. The difference is particularly stark when we consider a system like Lewis’s, in which semantic values are functions from (inter alia) contexts to truth values (so that we can at least consider operators that manipulate the context parameter), but characters—functions from c to content—play no role in the semantics proper (so that the notion of an operator on character is totally inapplicable).¹⁵

¹⁵Insofar as Lewis wants a notion of assertoric content (in a context) he can define a post-semantic notion of “character” which maps a contexts to contents (or he could even define multiple “character” functions $character_1$ and $character_2$, one that outputs the diagonal content and one that outputs the horizontal content). The point here is simply meant to

Kaplan’s objection to monsters is *not* an objection to formal monsters *as such*. It is rather an objection to an effect that the introduction of formal monsters would have given his other commitments. In particular, Kaplan objects that if there were formal monsters, then what an expression contributes to what is said by an utterance at a context c might not be that expression’s content at c ; and this contradicts Kaplan’s view that it is content that plays the content role. So fundamentally, the kind of operator that Kaplan finds objectionable is a *content monster*:

Content Monster. A *content monster* is an operator that shifts the contribution that an expression makes to what is said.¹⁶

Given Kaplan’s commitments—in particular, assuming that the context is the list of all content-generating parameters—all formal monsters are content monsters and vice versa.¹⁷ So by banning formal monsters, Kaplan also bans content monsters.

It would make little sense for Kaplan to insist on banning formal monsters as such—why would anyone care whether natural language semantics requires a certain obscure technical gadget? Formal monsters are not interesting *qua* formal monsters—without a theoretical role for the parameter c .¹⁸ Imagine a semantic theory that relativises truth to a “context” parameter c ,

be that there is no character function *specified* in Lewis’s compositional semantics which certain operators might attempt to “meddle” with.

¹⁶More precisely, we put it as follows: For a construction $\Sigma\phi$, Σ is *content monster* iff Σ semantically shifts parameter z and the content of ϕ varies across different values for z . That is, a content monster is an operator that shifts a content-generating parameter. See Appendix A for alternative definitions in terms of “indexical shift”.

¹⁷As we’ve noted already this doesn’t quite hold in LD, since the assignment is construed as a content-generating parameter but its not officially a parameter of c . Thus, the LD system doesn’t have any formal monsters—operators that shift c —but there are operators that shift the assignment, and thus there are operators that are content monsters in LD (Rabern 2013). In the main text, we continue to operate with the alternative Kaplanian packaging where the context is the list of *all* content-generating parameters, and thus the assignment is a parameter of c —thus the equivalence between formal monsters and content monsters holds.

¹⁸Since Schlenker’s (2003) monsters manipulate an assignment parameter (and leave the c parameter alone), whereas Anand and Nevins’s (2004) monsters manipulate the c parameter, only the latter has formal monsters. Given that there is an alleged empirical difference between the proposals of Anand and Nevins and Schlenker one might conclude that whether or not a system has formal monsters does in fact have significant theoretical and empirical import. But such a conclusion would misconstrue the situation. The divide between these views in terms of formal monsters doesn’t actually track the alleged

where the context parameter is simply a time, and the temporal operators of the language such as ‘ F ’ shift this temporal context parameter: $\llbracket F\phi \rrbracket^c = 1$ iff there is a $c' > c$ such that $\llbracket \phi \rrbracket^{c'} = 1$. The operator ‘ F ’ here is a formal monster. But given that the theoretical role of c is simply to provide the temporal variation requisite for the compositional semantics of the temporal operators, it is clear that there is nothing worrisome about such an operator. If one objects that this parameter is not properly called a “context” parameter, that raises the question: *why not?* And the answers that come to mind are various purported theoretical roles that “context” is supposed to play in a semantic theory. Thus, a “monster”, in the interesting sense, is an operator that shifts the “context” parameter—where that parameter is understood as playing a certain theoretical role.

For Kaplan the important role that *context* plays is concerned with the generation of content, thus it makes sense for him to insist on banning content monsters. To take a stand on whether or not there are content monsters is to take a stand on the relation between the objects that play the content role and the objects that play the compositional role; and as we have seen from our discussion of the dispute between Lewis and Kaplan in the previous section, this is to take a stand on the fundamental architecture of a semantic theory.

The relationship between the various notions of monsters is perhaps easiest to see if we set aside Kaplan’s formal system for a minute and think of the things that play the content role as structured propositions (as Kaplan himself often does).

Don’t think of propositions as sets of possible worlds, but rather as structured entities looking something like the sentences which express them. For each occurrence of a singular term in a sentence there will be a corresponding constituent in the proposition expressed. The constituent of the proposition determines, for each circumstance of evaluation, the object relevant to evaluating the proposition in that circumstance. (Kaplan 1989: 494)

Viewing things this way makes it easy to trace the contribution of individual words to what is said. On this picture, we could represent the content of an utterance of “I am hungry” (said in a context c_1 that provides Hazel as the

empirical differences between the views; it is easy to set up a system that makes the same predictions—concerning, e.g. “shift together”—as Anand and Nevins’s, but which does not have formal monsters.

referent of “I”) as a structured complex consisting of Hazel and the property of being hungry:

- (4) $\langle \text{Hazel, being hungry} \rangle$

When this sentence is embedded, for example, in the scope of a modal operator, as in “Possibly, I am hungry”, what is said (in the same context c_1) can be represented as a structured complex that includes (4) as a constituent (roughly, the proposition that attributes being possible to the proposition that Hazel is hungry):

- (5) $\langle \langle \text{Hazel, being hungry} \rangle, \text{being possible} \rangle$

In either case, “I” contributes Hazel to the structured entity that we are regarding as playing the content role, “is hungry” contributes the property of being hungry, and the sentence contributes the proposition (4). And Kaplan’s ban on monsters would ensure that this is always the case: setting aside quotation, “I am hungry” will contribute (4) to the content of utterances of any sentence in which it is a constituent, no matter how it is embedded.

The introduction of formal monsters would change this situation. Suppose (contra Kaplan) that it were possible to introduce “In some contexts it is true that” into English. An utterance of “In some contexts it is true that I am hungry” (said in the same context c_1 – i.e., by Hazel) would be true if and only if some agent of some context is hungry at the world and time of that context. What is said by such an utterance would be something like (6) (i.e., the proposition that the character of “I am hungry” is true at some context—which we can assume is a structure such as $\langle \text{the-speaker, being hungry} \rangle$, where ‘**the-speaker**’ is not being used with its ordinary English meaning, but as denoting a function from contexts to speakers of the context):

- (6) $\langle \langle \text{the-speaker, being hungry} \rangle, \text{being true at some context} \rangle$

This, of course, has nothing to do with Hazel in particular; so Hazel does not enter into what is said, the proposition (4) does not enter into what is said, and *a fortiori* “I” does not contribute Hazel to what is said. So placing a sentence containing “I” in the scope of a formal monster like “In some contexts it is the case that” shifts what “I” contributes to what is said (while placing the same expression in the scope of an index-shifting operator like “Possibly” does not).

We can see similar effects by considering again the idea that the semantics for quantifiers depends on an assignment function. If the assignment function

is an element of the context, then a quantifier like “every girl” is a formal monster. And because, given our assumptions, formal monsters are content monsters, placing “She is hungry” in the scope of a quantifier will result in a corresponding shift in the contribution of “She is hungry” to what is said. For example, we can consider a context c_2 in which an utterance of “She is hungry” expresses (4). It is intuitively clear that the structured proposition representing the content of “Every girl says that she is hungry” (as uttered in c_2), on the reading where “she” is bound by “every girl”, will not have Hazel as a constituent, and will not have (4) as a constituent; what is said has nothing to do with Hazel. So placing “she” in the scope of a context-shifting operator can change its contribution to what is said in a way that placing “she” in the scope of an index-shifting operator does not.

The point to notice, again, is that for Kaplan, introducing formal monsters amounts to introducing content monsters, and a ban on formal monsters amounts to a ban on content monsters. But it is possible to draw the two notions of a monster apart. In particular, they come apart in Lewis’s system. Like Kaplan, Lewis bans formal monsters. But this does not result in a ban on content monsters. *Lewis’s system allows content monsters.*

It is easy to see why if we consider how Lewis would treat quantifiers by means of an assignment function. First, we can ask: would Lewis include the assignment as an element of the context, or as an element of the index? Not as an element of the context: Lewis is clear that the job of context is to pick out a concrete situation of utterance, and he is clear that the job of the index is to account for all cases of shiftiness. So for Lewis, the assignment function, which is a shiftable parameter, must be an element of the index.¹⁹

¹⁹Lewis (1980) makes hardly any mention of variable binding and the assignment function. His tentative list of index coordinates only includes time, world, location, and standards of precision: “I have suggested that the list should include time, place, world, and (some aspects of) standards of precision. I am not sure what more should be added.” It’s unclear why he didn’t list the assignment as well. He seems to have been assuming that a quantified sentence doesn’t embed a genuine sentence—it embeds a mere “schmentence”—and since the entire discussion is concerned with the semantic values of *sentences* it would then make sense not to mention the assignment. Later in the discussion he suggests, “We can include the value assignments as coordinates of indices, as I did in [Lewis 1970], and thereby subsume assignment-dependence of formulas under index-dependence of sentences” (Lewis 1980: 33). The reference is to “General semantics” where he both explicitly categorises ‘ x grunts’ as a genuine sentence and includes an assignment coordinate among the coordinates upon which extension depends: “The extensions of ‘ x is tall’ of ‘son of y ’ depend on the assignment and world coordinates of indices just as the extensions of ‘I am

If *Kaplan* includes an assignment function as an element of the index, this has the effect of making what is said true or false only relative to an assignment. But *Lewis*’ inclusion of an assignment function as an element of the index has no such effect. This is because Lewis rejects the idea that the same formal object plays both the compositional role and the content role. Lewis might claim, for example, that what plays the compositional role is functions from contexts and indices (consisting of worlds and assignment functions) to truth values, but that the content role is played by functions from worlds to truth values—the result of supplying the function that plays the compositional role with a context and an assignment function appropriate to that context.

Thus, in a system like Lewis’s, where there is a distinction between semantic value and content, index-shifting operators may have the effect of shifting parameters upon which content depends—that is, in such a system what an expression contributes to what is said by an utterance at a context c might not be that expression’s content at c . This is to say that in Lewis’s system *index-shifting operators can be content monsters*.

Consider a simple example to demonstrate this point. Assume that in addition to the context c , extension is relativised to an index consisting of an assignment, a time, and a world—thus points of reference are quadruples $\langle c, g, t, w \rangle$. The semantics proper will recursively define $\llbracket \cdot \rrbracket^{c,g,t,w}$. But we follow Lewis and don’t build into the semantics proper an identification between assertoric content and sets of indices. Instead we provide a post-semantic definition of content in terms of semantic values. For example, assuming eternalism about propositions, so that that contents are simply sets of worlds, we can define the content of a sentence ψ in a context c as follows:²⁰

Classic content. $|\psi|^c = \{w : \llbracket \psi \rrbracket^{c,g_c,t_c,w} = 1\}$

Given this, consider sentence (7) which embeds under the index-shifting operator “PAST” to form sentence (8):²¹

tall’ of ‘son of mine’ depend on the speaker and world coordinates” (Lewis 1970: 24-25).

²⁰If one prefers to understand content in terms of structured propositions, then one can view this as a definition of the *intension* of the structured content expressed by a sentence in a context.

²¹Compare Richard (1982) and Salmon (1989), who also reject the claim that propositions do the compositional work in the semantics of tense. For example, Salmon concludes

- (7) Hazel walks
- (8) PAST(Hazel walks)

A standard semantic clause for “PAST” construes it as an index-shifter that quantifies over past times:

$$\llbracket \text{PAST } \phi \rrbracket^{c,g,t,w} = 1 \text{ iff } \exists t' < t \text{ such that } \llbracket \phi \rrbracket^{c,g,t',w} = 1$$

The operator “PAST” clearly shifts a parameter upon which the content of its complement depends. The content of (7) in c is the following:

$$|\text{Hazel walks}|^c = \{w : \llbracket \text{Hazel walks} \rrbracket^{c,g_c,t_c,w} = 1\}$$

But that content is not what is relevant for the content of (8) at c . Since the semantics of “PAST” requires evaluation of (7) at various shifted time parameters, it doesn’t look to it’s content (set of worlds), but instead to its associated set of indices—and thus it shifts parameters upon which the content of (7) depends.

For a final example, consider (9) which embeds under a quantifier to form (10).

- (9) He_1 is mortal
- (10) Every man_1 is such that he_1 is mortal.

A Tarskian semantics for a universal quantifier construes it as an assignment-shifting operator as follows:²²

$$\llbracket \text{Every } \text{man}_1 \text{ is such that } \phi \rrbracket^{c,g,t,w} = 1 \text{ iff } \forall x \in \text{man}, \llbracket \phi \rrbracket^{c,g[1/x],t,w} = 1$$

that “temporal operators must operate on some aspect of their operands other than the information content, something other than *what is said* in uttering the operand” (Salmon 1989: 373).

²²Of course, standardly the roles of quantification and variable-binding are separated, such that strictly speaking variable binding is done by a covert abstraction operator, λ (see Lewis 1970: 45 and Heim and Kratzer 1998: 186). On this construal (10) is actually composed out of the following constituents: “every man” + λ_1 + “ he_1 is mortal”, and λ_1 first composes with “ he_1 is mortal” to provide a predicate meaning to compose with “every man”. To keep things simple we instead treat $[\text{every man } \lambda_1]$ as an atom which composes with sentence types. This doesn’t affect the main point—what we say about the variable-binding operator “every man_1 is such that” can instead be made by focusing on the lambda-binder alone (see Rabern 2013: §4)

Since the content of (9) in c is,

$$|\text{He}_1 \text{ is mortal}|^c = \{w : \llbracket \text{He}_1 \text{ is mortal} \rrbracket^{c,g_c,t_c,w} = 1\}$$

the quantifier, which shifts the assignment, shifts a parameter upon which the content of its complement depends. The semantic value of “he₁ is mortal” relevant for the compositional semantics of (10) is not the proposition it expresses at c , and the content of “he₁” at c doesn’t enter into the content of (10).

Thus, given our classic definition of assertoric content, index-shifting operators such as “PAST” or “every man” are monstrous.

4 Monsters and content

As we have seen, Kaplan’s theory and Lewis’s theory both relativise semantic values to two parameters, a “context” c and an “index” i . We have so far argued that shifting the “index” parameter can have very different effects in the two systems; in particular, in Lewis (but not in Kaplan), index shifters can be content monsters. So in order to evaluate claims about monsters, one needs to pay attention to what the formal devices of one’s system represent. This is the claim that we attributed to Stalnaker as (S):

- (S) In evaluating claims about monsters, one must pay attention not only to the formal devices of one’s semantic theory, but also to the theoretical role that these formal devices play.

On a first pass, Stalnaker’s case against monsters focuses on the representational role of the c parameter. He points out that the c parameter is (following Lewis) typically conceived as modelling “the *context of utterance*: the concrete situation in which the utterance being interpreted takes place” (2014: 214). And he claims that context, so conceived, “cannot shift, compositionally” (2014: 214). In effect, the claim is just that no operator can move an utterance to a different concrete situation. If we conceive of c as representing the concrete situation in which the utterance takes place, then the idea of a formal monster makes little sense. We take this to be a corollary of (S):

Corollary S1 Whether one regards formal monsters as a theoretical possibility will depend on the theoretical role one takes the context parameter to play.

Stalnaker also claims that the ban on monsters “is no substantive constraint, since the general abstract theory puts no constraints on what can go in the index” (2014: 210). In particular, Stalnaker follows Lewis in maintaining that “the index should include all of the ‘shiftable’ elements” (2014: 210). And Stalnaker regards this as upholding Kaplan’s ban on monsters. Since this is in effect just the Lewisian view discussed in the previous section, our response should be clear: this is *not* enough to uphold the ban on monsters, since it does not ban content monsters.

Yet, there is a second thread to Stalnaker’s case against monsters, which we take to be essentially correct. This second thread focuses on what plays the role of *content*. To spell out this thread we will look at two related cases: Santorio’s (2012) semantics for “might”, which he claims is monstrous, and Cumming’s (2008) semantics for attitude verbs, which he claims isn’t monstrous.

4.1 Monsters and diagonal content

Stalnaker rejects the account of content described in the previous section; and some expressions that are monsters given that view of content are not monsters on Stalnaker’s preferred view.

Stalnaker’s view of content and its ability to explain away various putative monsters rest on a number of controversial claims about the metaphysics of modality and its role in an account of communication. But Stalnaker’s basic point can be made by considering a related, but simpler, view, which involves a departure from the notion of content described in the previous section that is similar to what Stalnaker proposes. We consider the simplification in this section leaving various thorny details aside.²³

The notion of content described in the previous section is what we called *classic content*. The classic content of a sentence in a context is a set of worlds. But for some purposes it is useful to work with a *finer grained* notion of content; i.e., a notion on which two sentences in contexts that are true

²³But we present Stalnaker’s view in more detail in a supplement “Stalnaker vs. Monsters”, which is available online: semanticsarchive.net/Archive/WU5MjQwN/monsters-theoretical-supplement.pdf

in exactly the same worlds can nonetheless differ in content. For example, imagine two people meeting for the first time and introducing themselves; one says, “I am David”, and the other says, “I am Bob”. Assuming that each utterance is true, the classic content of the two utterances will be the same: each is true in every world. But plausibly the two utterances do not communicate the same thing, and so it is natural to look for a notion of content on which they do not have the same content.

Lewis (1979) proposes that the content of certain psychological states can be thought of as a set of *centered worlds*. These are typically thought of as ordered triples of a world, a time, and an agent. On this view, for example, the content of the belief that I am hungry will be the set of centered worlds $\langle a, t, w \rangle$ in which a is hungry at t in w .

Taking sets of centered worlds to play the content role would enable us to distinguish the contents of “I am David” and “I am Bob”. The content of “I am David” would be the set of centered worlds centered on David—i.e., the set of centered worlds $\langle a, t, w \rangle$ in which a is David (at t in w); while the content of “I am Bob” would be the set of centered worlds centered on Bob. And in general, the content of a sentence ϕ will be the set of centered worlds $\langle a, t, w \rangle$ which are such that a could truly utter ϕ at t in w . Since centered worlds are also our representations of context, this can equally well be thought of as the set of contexts in which ϕ could be uttered truly. This is what Stalnaker calls the *diagonal content*²⁴ (setting aside the complications we mentioned above):

Diagonal content. $\dagger\phi\dagger = \{c' : \llbracket \phi \rrbracket^{c', g_{c'}, t_{c'}, w_{c'}} = 1\}$

Stalnaker’s focus in his discussion of monsters is on a set of examples due to Santorio (2012). Santorio’s cases involve *de se* or *self-locating* ignorance, where indexicals occurring under epistemic modals seem to shift. Consider the case of mad Heimson.²⁵

Heimson is a bit crazy, and considers himself to be a philosopher of the Scottish Enlightenment, but he’s not certain which one he is: Stewart,

²⁴See also Heim (2004) who discusses in a favourable way the view that “it really always is the diagonal proposition that the listener must recover in order to understand the utterance” (55).

²⁵This is not the actual example that Santorio (2012) uses, which involves two amnesiacs, a coin toss, and indicative conditionals, but it is a quick and easy way to get to the heart of the matter.

Hume, or Smith. Alone in his study, he says to himself, “I might be Hume”.

Since for all Heimson knows he is Hume, it seems that Heimson’s utterance of (11) is true (or at least true for Heimson).

(11) I might be Hume.

But on a standard treatment of indexicals and modals Heimson’s utterance would be false. The indexical gets its referent from the context and the modal quantifies over the epistemically accessible worlds. Thus Heimson’s utterance of (11) is true only if there is a world where Heimson is identical to Hume. But there is no such world, so on a standard view (11) is false.

Santorio points out that in (11) “might” looks like a monster, since it looks like in order for Heimson’s utterance of (11) to be true, we need to let “I” pick out someone other than Heimson (at a world). Santorio makes the following suggestion:

When ‘I’ occurs under an informational modal, it refers not to the actual speaker, but rather to representatives of the actual speaker in the relevant information state. (Santorio 2012: 373)

Let’s say that a centered world $\langle a, t, w \rangle$ is an epistemic possibility for a speaker just in case for all she knows, she is a at t in w . Then we get the right reading if we give a semantic clause for “might” like:

(12) $\llbracket \text{might } \phi \rrbracket^{c,g,t,w} = 1$ iff $\exists c'$ such that c' is an epistemic possibility for a_c ; and $\llbracket \phi \rrbracket^{c',g_{c'},t_{c'},w_{c'}} = 1$

Given our definition of a content monster, the operator in (12) is a content monster, if content is classical.

But notice that the operator in (12) is *not* a content monster under the assumption that content is the diagonal. This is, in effect, Stalnaker’s second thread in his case against monsters.²⁶ The classical content of “I am Hume”

²⁶The operator defined in (12) is a formal monster, and we have already seen that Stalnaker finds formal monsters objectionable. But we have also seen how to achieve the effect of formal monsters by shifting parameters of the index rather than parameters of the context. For the sake of simplicity, we stick to (12) for now; we will return in a moment to a proposal which is not formally monstrous, and which is also more in line with Santorio’s actual semantics.

varies depending on the context of utterance. Since (12) shifts the context parameter, if content is classical, then (12) is a content monster. But the diagonal content does not vary depending on the context of utterance—the diagonal content of “I am Hume” is the same no matter who is speaking—nor does diagonal content vary depending on the various parameters of the index. So (12) does not shift any parameter on which diagonal content depends. So if content is the diagonal, then operator (12) is not a content monster.

We can put the point in terms of structured propositions. Given (12), the content of an utterance by Heimson of “I might be Hume” will be something like:

(13) $\langle\langle\text{the speaker, being Hume}\rangle, \text{being an epistemic possibility}\rangle$

The classical content of an utterance by Heimson of “I am Hume” will be something like:

(14) $\langle\text{Heimson, being Hume}\rangle$

Since (14) does not enter into (13), “might” is a monster with respect to classical content. But the diagonal content of Heimson’s utterance of “I am Hume” will just be something like:

(15) $\langle\text{the speaker, being Hume}\rangle$

And (15) is precisely what enters into the content of (13). So “might” is not a monster with respect to the diagonal content.²⁷

4.2 Content and assignment-shifting modals

The important lesson to draw from the above discussion is that which operators count as monsters will depend on one’s notion of content. We will substantiate this conclusion further by contrasting Santorio’s avowedly monstrous semantics for epistemic modals with an extremely similar avowedly non-monstrous semantics for belief reports developed by Cumming (2008). It turns out that the crucial difference between Cumming’s view and Santorio’s is not in the formal semantics, but in the account of content.

In Santorio’s semantics, the semantic value of “I” is given by the assignment function, which he regards as a parameter of the index:

²⁷We’ve shown already that not all content monsters are formal monsters: for example, quantifiers in Lewis’s semantics are content monsters but not formal monsters. A further conclusion to draw from the example just discussed is that not all formal monsters are content monsters. Thus the notions are entirely separable.

$$(16) \quad \llbracket I \rrbracket^{c,g,t,w} = g(1)$$

As Santorio points out, once we have made analogous moves for all context-sensitive expressions, then the context parameter plays no role in the compositional semantics *per se*.²⁸ We can take the role of context to be purely post-semantic: it fixes parameters of the index relevant to determining the content and truth value of an utterance. (We retain the c parameter in the compositional semantics in order to preserve the formal parallel with the Kaplanian and Lewisian views described above.) For example, in order to make plausible predictions about the truth values of utterances involving “I”, each context c will determine an assignment g_c which is such that $g_c(1) = a_c$.

On this view, there is no need for formal monsters (and no role for formal monsters; since the c parameter plays no role in the compositional semantics, shifting it would have no effect). We will not try to describe the extension of the view to other context-sensitive expressions, but will assume for the sake of simplicity that “I” is the only context-sensitive expression to be treated by the theory. With this simplifying assumption in place, let’s say that an ordered triple of a world w , time t , and assignment g is an epistemic possibility for a speaker just in case for all she knows, she is $g(1)$ in w at t . Then Santorio’s semantics for “might” is (with a few simplifying assumptions, see Santorio 2012: 377):

$$(17) \quad \llbracket \text{might } \phi \rrbracket^{c,g,t,w} = 1 \text{ iff } \exists g', w', t' \text{ such that } \langle w', t', g' \rangle \text{ is an epistemic possibility for } g(1); \text{ and } \llbracket \phi \rrbracket^{c,g',t',w'} = 1$$

Although (17) is not a formal monster, Santorio still advertises his proposal as a defense of monsters, and this makes sense on a classic view of content: (17) shifts the assignment parameter, but classic content varies with different choices of assignment.²⁹

²⁸Formally speaking a context c and an assignment g are each just sequences of objects, so we shouldn’t get too hung up on the symbols used to represent them—in an important sense a context is an assignment and vice versa. The difference, if any, is only due to what theoretical roles we associated with c and g , respectively.

²⁹Schlenker’s (2003) avowedly monstrous semantics is similar in this respect. von Stechow (2004) complains that Schlenker’s (2003) semantics is not actually monstrous since “... attitudes quantify over contexts, but they never shift the context of utterance” (2004: 452). His charge is that “attitudes quantify over triples that are composed of the same components as context, but they are not contexts of utterances but rather indices” (2004: 479-480). It’s true that on Schlenker’s “monster-friendly” semantics (see Schlenker 2003: 104ff) the attitude operators never shift the context parameter c . Instead they modify

Interestingly, however, Cumming (2008) defends an extremely similar semantics but explicitly denies that his view is monstrous. Cumming is concerned to give a view that predicts that belief attributions such as “Biron thinks that Hesperus is visible” and “Biron thinks that Phosphorus is visible” can differ in truth value. Since content is defined in part as the object of attitudes like belief, one might insist these ascriptions can differ in truth value only if the content of “Hesperus is visible” is distinct from the content of “Phosphorus is visible”. But on standard assumptions, “Hesperus is visible” and “Phosphorus is visible” have the same classic content in every context. So content cannot be classic content. We need an alternative.

Cumming’s view is that uses of names should be semantically represented as variables, so that particular uses of “Hesperus is visible” and “Phosphorus is visible” will be equivalent to something like (18) and (19) respectively:

(18) x_2 is visible

(19) x_3 is visible

Cumming departs from classic content in that he takes content to be what he calls *open propositions*, which are true and false with respect to a world, time, and assignment. For example, on Cumming’s view, the content of “Hesperus is visible” in a context is the set of world, time, assignment triples $\langle w, t, g \rangle$ such that $g(2)$ is visible at t in w .³⁰ In general, Cumming claims that content is *open content*:

Open content. $|\phi|^c = \{ \langle w', t', g' \rangle : \llbracket \phi \rrbracket^{c, g', t', w'} = 1 \}$

the assignment function s , and the personal pronoun is essentially treated as a variable that is sensitive to the assignment (in a way that is similar to Santorio’s semantics). Thus, von Stechow’s complaint is that Schlenker’s semantics is not formally monstrous. It shifts indices, and not contexts: “ $I_{Amharic}$ ” is sensitive to the index and “says” is an index-shifting operator. Of course, Schlenker’s semantics has operators that shift the extension of the personal pronoun “ $I_{Amharic}$ ” (or its analog in the formal system “ $agent(c_i)$ ”), so this is why Schlenker insists that it is monstrous. From our point of view, the interesting issue is whether the attitude operators in Schlenker’s system are content monsters. We can resolve this question only once we have an account of assertoric content. Given many standard accounts, the attitude operators would turn out to be content monsters. But Schlenker does not explicitly endorse these accounts (and indeed, says nothing about how to define assertoric content). (See Appendix A for more discussion of this issue.)

³⁰In order to preserve the structural parallels with other views discussed in this paper, we are departing from the letter of Cumming’s view in two ways: first, Cumming takes content to be a function from assignments to classic contents (i.e., the schönfinkelization of open propositions as we have presented them); and second, he does not relativise to times. These departures are irrelevant to the issues at hand.

Cumming’s semantics for “believes” is closely related to Santorio’s semantics for “might”. Let an ordered triple of a world, time, and assignment $\langle w, t, g \rangle$ be a doxastic possibility for an agent just in case it is compatible with what she believes that she is at t in w and the reference relation is as represented by g (so that, for example, if a use of “Hesperus” corresponds to x_2 , then if $g(2) = \text{Venus}$, $\langle w, t, g \rangle$ is a doxastic possibility for Biron just in case it is compatible with Biron’s beliefs that he is in w at t and his use of “Hesperus” refers to Venus).

$$(20) \quad \llbracket \text{Biron believes that } \phi \rrbracket^{c,g,t,w} = 1 \text{ iff } \forall g', w', t' \text{ such that } \langle w', t', g' \rangle \text{ is an doxastic possibility for Biron, } \llbracket \phi \rrbracket^{c,g',t',w'} = 1$$

Cumming insists that his belief operators are not monsters.

These are not “monsters” in Kaplan’s sense since they do not shift the *context* itself but instead two indices—the assignment and the world...
(Cumming 2008: 542)

If he’s right, it’s for the wrong reason. By pointing to the fact that the shifted parameter is an *index* parameter instead of a context parameter Cumming is simply alluding to the (relatively uninteresting) fact that the belief operators are not *formal* monsters.³¹ The important point is that they also aren’t content monsters, assuming that the operative notion of content is open content. That is, (20) is not monstrous with respect to open contents: (20) shifts the assignment, time, and world parameters, but open contents are open with respect to precisely these parameters. For exactly the same reason, (17) is not a monster with respect to open contents (although both are monstrous with respect to classic contents).

Cumming tends to advertise his view as a Kaplanian view, and given that it is non-monstrous in this way this might seem right. But we should note that an advocate of open content, while they might uphold the Kaplanian prohibition on monsters, they only do so at the cost of giving up another

³¹Of course, since on Cumming’s view the context c determines a contextual assignment g_c , and names are sensitive to the contextual assignment, one might charge that this commits Cumming to the view that his operators are monstrous in the sense that they can shift the referent of context-sensitive expressions. But Cumming (2008) claims that on his variabilist view of names, names are not context-sensitive. This is because he holds (without any explanation) that for any name α , and any contexts c and c' , $\llbracket \alpha \rrbracket^{c,g_c} = \llbracket \alpha \rrbracket^{c',g_{c'}}$ (see Cumming 2008: 546).

important Kaplanian tenet: “direct reference”. A expression is *directly referential* just in case nothing at the level of “content” mediates the relation between the expression and its extension (see Kaplan 1989b: 568-569). On any plausible understanding of Cumming’s view there is “mediation” at the level of open content between a name and its extension—the open content of a name is a function from assignments to referents, thus the component contributed to the open content by a name is the mechanism that governs the search for its referent instead of the referent itself. Cumming insists that he captures “the intuition of direct reference for names to precisely the extent that [Kaplan] does for indexicals” (2008: 541-2). But the difference is clear, since for Kaplan’s indexicals, the mechanism that governs the search for the referent (character) is, of course, not a component of the content.

The main conclusion of this section is that whether a given operator is a content monster depends on what notion of content one adopts. For example, a semantics for epistemic modals that is monstrous if content is classic is not monstrous if we take content to be the diagonal. This entails that one cannot tell whether a given semantic theory endorses monsters simply by looking at the formalism. Cumming and Santorio might agree entirely on the right formal semantics, but disagree about whether there are monsters, if one endorses classic content and the other endorses open content. We take this to be another corollary of (S):

Corollary S2 Whether a given formal theory includes content monsters depends on what we take to play the content role.

5 Conclusion

As we have presented it, what is at issue in Kaplan’s ban on monsters is the idea that a single entity can play two theoretical roles: the content role, and the compositional role. If there are content monsters, then no single entity can play both roles. This is why Kaplan opposes monsters: to accommodate monsters in his system, characters, not contents, would have to play the compositional role. The ban on formal monsters is important to Kaplan because it results in a ban on content monsters. Lewis (and following him, Stalnaker) also ban formal monsters, but for quite different reasons. Lewis positively advocates having different entities play the content role and the compositional role, so his ban on formal monsters does not result in a ban on content monsters.

Exactly which operators are content monsters will depend upon one's notion of content. We showed in particular that a semantics for epistemic modals that is monstrous given a standard notion of content (what we called *classic content*) is not monstrous if content is *open content* or *diagonal content*. We can extend this observation further: if one insists that content *never* varies across contexts, then one outright denies the possibility of content monsters. On such views there are no content-fixing parameters; changing any parameter of the point of reference does not change the content expressed by a sentence. Proponents of diagonal content therefore clearly deny the possibility of content monsters, and a proponent of open content who treats all context sensitivity with the assignment parameter likewise denies the possibility of content monsters.

Have we then shown that there are no monsters? The answer to this question will depend on whether diagonal contents or open contents are good candidates to play the content role. Can we make sense of the idea that what we assert and what we believe is true and false only with respect to a context or an assignment function? This is an issue about which even proponents of open content may have qualms. Cumming, for example, writes, "I prefer to think of open propositions as an *intermediate layer of content*" (2008: 542), and suggests, "On my analysis, there are two notions of proposition, 'open' and 'closed.' An utterance of a sentence will have one of each kind of content, the closed content being the result of applying the open content to the contextual variable assignment" (2008: 544) (so that closed contents are equivalent to what we have called *classic content*). The result of this mixed picture means that Cumming's assertion that his view does not require monsters is at best a half-truth: "believes" is not a content monster with respect to open content, but it is a content monster with respect to closed content. The precise significance of this result will depend on exactly what theoretical role Cumming takes closed contents to play, and this is an issue about which he has little to say. But it is reasonable—at least provisionally—to regard him as departing from the Kaplanian idea that a single entity plays the content role and the compositional role, and hence as a proponent of monsters.

More generally, claims about monsters must be approached from two directions simultaneously. One must, of course, attend to the best formal semantic theories. But one must also attend to how those theories can be situated in satisfactory general theory of linguistic communication. We have located two points where the latter sort of consideration matters: one's views

about monsters will depend on one’s view of the representational significance of the context parameter, and (especially) on one’s views about what plays the content role. A purported defense of monsters—or of the claim that there are no monsters—can be successful only once these issues are resolved.

A Appendix: Indexical shift

A common gloss on monsters casts them as operators that shift the reference of indexicals. One might therefore think that there is an alternative definition of monsters that avoids our corollary S2 and the issues concerning which notion of “content” is operative. On a first pass one might try this:

Reference shift. For a construction $\Sigma\phi$, Σ is a monster iff Σ semantically shifts parameter z and the extension of ϕ varies across different values for z .

One might insist that certain semantic proposals (e.g. Santorio and Schlenker) satisfy this definition even without any commitment on propositional content, since their operators shift the assignment and indexicals are sensitive to the assignment. But the definition in terms of mere reference is clearly no good, since on this definition even modal operators will come out as monstrous. For example, “Obama is a democrat” varies in extension across the world parameter w . And “necessarily” shifts the world parameter.

The monster issue is not just about shifting the reference (or extensions) of just some expression or other, the issue concerns shifting the referent of an *indexical* or context-sensitive expression in particular. So one might try this:

Contextual reference shift. For a construction $\Sigma\phi_\alpha$, which contains a context-sensitive expression α , Σ is a monster iff Σ semantically shifts parameter z and the extension of α varies across different values for z .

This seems to line up well with what theorists in the literature say, and is in line with Kaplan’s discussion. But the definition prompts a further question: what is a context-sensitive expression? One idea would be the following:

Context-sensitivity 1. α is context-sensitive iff there are contexts c and c' such that $\llbracket \alpha \rrbracket^{c, i_c} \neq \llbracket \alpha \rrbracket^{c', i_{c'}}$.

Given this definition, context sensitivity is a matter of extension varying with context. The definition of contextual reference shift construed along these lines seems to line up well with what Schlenker’s calls the *Fixity Thesis*: The referent of an indexical is fixed solely by the context, and cannot be affected by any logical operators (Schlenker 2003: 29). To define the class of “indexicals” Schlenker appeals to a definition in terms of context-dependency:

At this point one might be tempted to plead terminological ambiguity. In what sense is [an expression] an ‘indexical’ in Kaplan’s sense? Let us use context-dependency as a Definition: *an expression qualifies as indexical if its semantic value is determined by some feature of a context of utterance.* (Schlenker 2003: 31)

Given the surrounding discussion it is clear that by “semantic value” he means referent, so his notion of indexicality seems to be in accord with *context-sensitivity 1*.³² But this will simply return us to the problem we faced above. Too many expressions will count as “indexicals” or “context” sensitive (e.g. non-rigid expressions such as “the president” or contingent sentences such as “Obama is a democrat” vary in extension across contexts; cf. Lewis who says “contingency is a kind of indexicality” (Lewis 1980: 82)).

Context-sensitivity is usually understood to involve more than mere variability of reference—it is usually understood as a claim about the variability of the *content* of an expression across contexts (perhaps Schlenker would agree that by “semantic value” he means content). A more standard definition would go as follows (where $|\alpha|^c$ provides the content of α in context c).

Context-sensitivity 2. α is context-sensitive iff there are contexts c and c' such that $|\alpha|^c \neq |\alpha|^{c'}$.

This definition is good as far as it goes, but we’ve gone in a large circle. Since the definition of contextual reference shift employs a notion of context

³²In a similar vein Shklovsky and Sudo (2014) say the following: “Every natural language has words and phrases whose meanings refer to certain aspects of the context of utterance (e.g. *I, you, here, now*, etc.). These items are called *indexicals*. [...] if a monster did exist, indexicals under its scope would be interpreted relative to non-actual contexts and hence *I* could refer to somebody other than the speaker of the sentence, for example. We refer to such a phenomenon as *indexical shifting*” (381-382). But what it is for “the meaning of an expression to refer to an aspect of context”?

sensitivity which appeals to “content”, the definition essentially reduces to our preferred definition of a *content monster*. We haven’t avoided the issue concerning which notion of “content” is operative.

A last resort strategy for those who wish to avoid issues concerning “content” would be to just list a certain class of expressions *the indexicals*: {I, you, ...}. Then replace mention of context-sensitivity in the definition with an appeal to expressions in that class. It seems that some of the linguistics literature on monsters tends to lean in this direction, and it seems to be the notion that Santorio (2012) is primarily guided by.

“Indexical” reference shift. For a construction $\Sigma\phi_\alpha$, which contains an expression $\alpha \in \{\text{I, you, ...}\}$, Σ is a monster iff Σ semantically shifts parameter z and the extension of α varies across different values for z .

But this definition is completely uninteresting given that the set {I, you, ...} is stipulative. Why is it interesting that there are operators that shift the extension of expression in *that* class? We need to be told something about the expressions in that class in order for the ban on monsters to have any substance. We claim that the best way to flesh out the definition is to say that the interesting class of expressions are the ones whose *content* varies with context. Thus, the monster issue can only be addressed once the issues concerning what plays the content role are resolved.

References

- Anand, P. and Nevins, A.: 2004, Shifty operators in changing contexts, *Proceedings of SALT*, Vol. 14, pp. 20–37.
- Cumming, S.: 2008, Variablism, *Philosophical Review* **117**(4), 605–631.
- Davies, M. and Humberstone, L.: 1980, Two notions of necessity, *Philosophical Studies* **38**(1), 1–31.
- Del Prete, F. and Zucchi, S.: 2017, A unified non monstrous semantics for third person pronouns, *Semantics and Pragmatics* **10**(10).
- Dummett, M.: 1973, *Frege: Philosophy of Language*, London: Gerald Duckworth.

- Evans, G.: 1979, Reference and Contingency, *The Monist* **62**, 161–189.
- Heim, I.: 2004, Lecture notes on indexicality, *Notes for class taught at MIT*.
- Heim, I. and Kratzer, A.: 1998, *Semantics in Generative Grammar*, Blackwell Publishers.
- Kamp, H.: 1971, Formal properties of ‘now’, *Theoria* **37**, 227–274.
- Kaplan, D.: 1978, Dthat, *Syntax and semantics* **9**, 221–243.
- Kaplan, D.: 1989, Demonstratives, in J. Almog, J. Perry and H. Wettstein (eds), *Themes from Kaplan*, Oxford University Press, pp. 481–563.
- Kaplan, D.: 1989b, Afterthoughts, in J. Almog, J. Perry and H. Wettstein (eds), *Themes from Kaplan*, Oxford University Press, pp. 565–614.
- King, J. and Stanley, J.: 2005, Semantics, pragmatics, and the role of semantic content, in Z. G. Szabo (ed.), *Semantics Versus Pragmatics*, Oxford University Press, pp. 111–164.
- Lewis, D.: 1970, General semantics, *Synthese* **22**(1), 18–67.
- Lewis, D.: 1979, Attitudes de dicto and de se, *The Philosophical Review* **88**(4), 513–543.
- Lewis, D.: 1980, Index, context and content, in S. Kanger and S. Ohman (eds), *Philosophy and Grammar*, Amsterdam: Reidel, pp. 79–100.
- Montague, R.: 1968, Pragmatics, in R. Klibansky (ed.), *Contemporary Philosophy: A Survey*, Vol. 1, Florence, La Nuova Italia Editrice, pp. 102–22. Reprinted in *Formal philosophy: selected papers of Richard Montague*, 1974.
- Ninan, D.: 2010, Semantics and the objects of assertion, *Linguistics and Philosophy* **33**(5), 335–380.
- Ninan, D.: 2012, Counterfactual attitudes and multi-centered worlds, *Semantics and Pragmatics* **5**(5), 1–57.
- Rabern, B.: 2012, Against the identification of assertoric content with compositional value, *Synthese* **189**(1), 75–96.

- Rabern, B.: 2013, Monsters in Kaplan's logic of demonstratives, *Philosophical Studies* **164**(2), 393–404.
- Rabern, B.: 2017, A bridge from semantic value to content, *Philosophical Topics* **45**(2).
- Recanati, F.: 2017, From meaning to content, in D. Ball and B. Rabern (eds), *The Science of Meaning*, Oxford : Oxford University Press.
- Richard, M.: 1982, Tense, propositions, and meanings, *Philosophical Studies* **41**(3), 337–351.
- Salmon, N.: 1989, Tense and singular propositions, in J. Almog, J. Perry and H. Wettstein (eds), *Themes from Kaplan*, Oxford University Press, pp. 331–392.
- Santorio, P.: 2012, Reference and monstrosity, *Philosophical Review* **121**(3), 359–406.
- Schaffer, J.: 2012, Necessitarian propositions, *Synthese* **189**(1), 119–162.
- Schlenker, P.: 2003, A plea for monsters, *Linguistics and Philosophy* **26**(1), 29–120.
- Scott, D.: 1970, Advice on modal logic, in K. Lambert (ed.), *Philosophical Problems in Logic: Some Recent Developments*, D. Reidel, pp. 143–173.
- Shklovsky, K. and Sudo, Y.: 2014, The syntax of monsters, *Linguistic Inquiry* **45**(3), 381–402.
- Stalnaker, R.: 1970, Pragmatics, *Synthese* **22**, 272–289.
- Stalnaker, R.: 2014, *Context*, Oxford University Press.
- Stalnaker, R.: 2017, David Lewis on context, in D. Ball and B. Rabern (eds), *The Science of Meaning*, Oxford : Oxford University Press.
- Stanley, J.: 1997, Rigidity and content, in R. Heck (ed.), *Language, thought, and logic: Essays in honor of Michael Dummett*, Oxford University Press, pp. 131–156.

- von Stechow, A.: 2004, Binding by verbs: Tense, person and mood under attitudes, *in* H. Lohnstein and S. Trissler (eds), *The Syntax and Semantics of the Left Periphery*, Berlin-New York: Mouton de Gruyter, pp. 431–488.
- Yalcin, S.: 2014, Semantics and metasemantics in the context of generative grammar, *in* A. Burgess and B. Sherman (eds), *Metasemantics: New Essays on the Foundations of Meaning*, Oxford University Press.